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**Notice of Allowability**

Application No.

10/692,704

Applicant(s)

JONES, BRIAN B.

Examiner

Amanda H. Merlino

Art Unit

2877

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to application filed 10/24/03.
2. ☒ The allowed claim(s) is/are 1-28 and 30-33.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All   b) ☐ Some\*   c) ☐ None   of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
  - \* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☒ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
  - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
    - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
  - (b) ☒ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

- |   |  |
|---|--|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                | 6. <input type="checkbox"/> Interview Summary (PTO-413),<br>Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),<br>Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment                    |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br>of Biological Material          | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance   |
|   | 9. <input type="checkbox"/> Other _____.   |

### EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Andrew Mickelsen on 2/1/06.

The application has been amended as follows:

a) on line 12 of claim 27,

--wherein:

an expression for the BRDF includes a first integral over a source solid angle, a second integral over the sample surface, a third integral over detector solid angle, and an integrand that includes the estimated-differential-scattering profile;

the first and second integrals are approximated to be the second integral based on the source electromagnetic radiation being in the form of the collimated beam;

the third integral is approximated to be one based on the detector being an imaging detector;

the second integral is are transformed from an integral over detector solid angle to a fourth integral over first and second dimensions in cosine space based on the sample surface being shift invariant; and

the fourth integral is integrated with respect to the first dimension and

deconvolved with respect to the second dimension to generate the estimated differential-scattering profile -- has been added after "(BRDF)";

- b) claim 29 has been canceled;
- c) on line 1 of claim 30, "29" has been replaced by -- 27 --;
- d) on line 1 of claim 31, "29" has been replaced by -- 27 --;
- e) on line 1 of claim 32, "29" has been replaced by -- 27 --;
- f) on line 1 of claim 33, "24" has been replaced by -- 27 --.

### ***Drawings***

New corrected drawings in compliance with 37 CFR 1.121(d) are required in this application because some of the figures are handwritten. Applicant is advised to employ the services of a competent patent draftsman outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

### ***Reasons for Allowance***

Claims 1-28 and 30-32 allowed.

Germer et al (6,034,776) teach of measuring scattered light and computing BRDF.

As to claims 1-20, prior of record, taken alone or in combination, fails to disclose or render obvious a computerized method for estimating scattering of electromagnetic radiation from a surface, the method comprising the steps of approximating the first and second integrals to be the second integral, approximating the second and third integral to be the third integral, transforming the coordinates of the third integral over detector

solid angle to first and second dimensions in cosine space to form a fourth integral, integrating over the first dimension of the fourth integral, differentiating the fourth integral with respect to the second dimension to generate the differential-scattering profile, in combination with the rest of the limitations of claim the rest of the limitations of claims 1.

As to claims 21-26, prior of record, taken alone or in combination, fails to disclose or render obvious a computerized method for estimating scattering of electromagnetic radiation from a surface, the method comprising the steps of approximating the first and second integrals to be the second integral, approximating third integral to be based on detecting electromagnetic radiation scattered from the surface at an imaging detector, transforming the coordinates of the second integral over the sample area first and second dimensions in cosine space to form a fourth integral, integrating over the first dimension of the fourth integral, differentiating the fourth integral with respect to the second dimension to generate the differential-scattering profile, in combination with the rest of the limitations of claim the rest of the limitations of claims 21.

As to claims 27-28 and 30-32, prior of record, taken alone or in combination, fails to disclose or render obvious an optical system comprising a computer device to generate an estimated differential scattering profile, wherein the estimated differential scattering profile is a continuous solution of a differential model of spectral scattering and non-spectral scattering derived from a convolution of a bidirectional reflectance distribution function (BRDF), wherein an expression for the BRDF includes a first integral over a source solid angle, a second integral over the sample surface, a third

integral over detector solid angle, and an integrand that includes the estimated differential scattering profile, the first and second integrals are approximated to be the second integral, third integral is approximated to be based on the detector being an imaging detector, the second integral is transformed from an integral over detector solid angle to a fourth integral over first and second dimensions in cosine space, the fourth integral is integrated with respect to the first dimension and deconvolved with respect to the second dimension, in combination with the rest of the limitations of claim the rest of the limitations of claims 27.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### **Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Amanda H Merlino whose telephone number is 571-272-2421. The examiner can normally be reached on Monday and Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J Toatley, Jr. can be reached on 571-272-2800 ext 77. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Amanda H Merlino *ahm*  
Patent Examiner  
Art Unit 2877  
February 2, 2006

*for*

Gregory J. Toatley, Jr.  
Supervisory Patent Examiner

*Layla G. Lauchman*

**LAYLA G. LAUCHMAN**  
**PRIMARY EXAMINER**